

Notice of Allowability

Application No.

10/748,344

Examiner

William M. Brewster

Applicant(s)

FRUTSCHY, KRISTOPHER J.

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 14 November 2005.
2. ☒ The allowed claim(s) is/are 1-49.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
- ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
- ☐ Notice of Informal Patent Application (PTO-152)
- ☒ Interview Summary (PTO-413), Paper No./Mail Date 121605.
- ☒ Examiner's Amendment/Comment
- ☒ Examiner's Statement of Reasons for Allowance
- ☐ Other _____.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Michael A. Bernadicou (Reg. No. 35,934) on 19 December 2005.

The application has been amended as follows:

a) In the Claims

In claim 38, line 8, before "induce", insert --preferentially--
in lines 10 - 12, after "induce" delete "heating in the semiconductor die; and heating the semiconductor die to couple the semiconductor die with the next level package" and insert --eddy currents in the semiconductor die to heat the semiconductor die and couple the semiconductor die with the next level package--

In claim 39, line 2, delete "semiconductor die" and insert --at least one interconnect--

In claim 41, line 11, before "induce" insert --preferentially--
in lines 10 - 12, delete "; and heating the semiconductor die to couple the semiconductor die with the next level package" and insert --to heat the semiconductor die and couple the semiconductor die with the next level package--

In claim 43, line 2, delete "semiconductor die" and insert -- at least one interconnect--

In claim 44, line 9 before "induce" insert --preferentially--

in lines 9-11, delete "; and heating the at least one interconnect to couple the semiconductor die with the next level package" and insert --to heat the at least one interconnect and couple the semiconductor die with the next level package--

In claim 45, line 2, delete "at least one interconnect" and insert --semiconductor die--

In claim 47, line 11 before "induce" insert --preferentially--

in lines 11-13, delete "; and heating the at least one interconnect to couple the semiconductor die with the next level package" and insert --to heat the at least one interconnect and couple the semiconductor die with the next level package--

In claim 49, line 2, delete "at least one interconnect" and insert -- semiconductor die--

Reasons for Allowances

The following is an examiner's statement of reasons for allowance: while Grabbe, US Patent No. 5,816,482 teaches in fig. 4, col. 3, lines 15-54, the preferentially inducing eddy currents in the at least one interconnect on top of a substrate, but not an interconnect between a semiconductor die and a next level package, it does not teach the features in claim 1, lines, lines 7-10, "generating an electromagnetic flux with an inductor; and exposing the semiconductor die to the electromagnetic flux to preferentially induce eddy-currents in the semiconductor die to heat the semiconductor die and couple the semiconductor die with the next level package." While Tsumura, US

Patent No. 6,288,376 teaches the horizontal moving of the inductor across the work piece, the applicant has discounted this from his definition of scanning, on p. 13, ¶ 4 of Remarks received 14 November 2005, "It is Applicant's understanding that moving an induction heating coil horizontally is not equivalent to scanning an inductor around a semiconductor die to induce eddy currents in a semiconductor die or an interconnect." Based on this definition, Tsumura does not teach the features in claim 41, lines 8-13, "generating an electromagnetic flux with an inductor; scanning the inductor around the semiconductor die while generating an electromagnetic flux; exposing the semiconductor die to the electromagnetic flux to induce heating in the semiconductor die; and heating the semiconductor die to couple the semiconductor die with the next level package." The prior art of record fails to teach, in combination, the process features.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William M. Brewster whose telephone number is 571-272-1854. The examiner can normally be reached on Full Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



20 December 2005
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